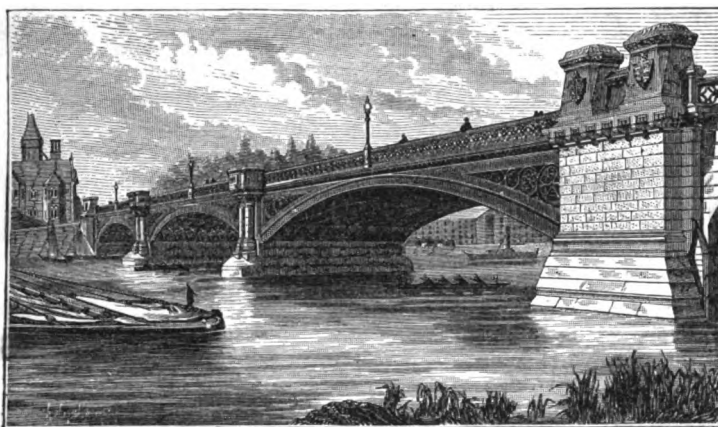


STRUCTURAL IRONWORK.

CAST-IRON COLUMNS.
" " STANCHIONS.
" " GIRDERS.

WROUGHT-IRON GIRDERS.
" " ROLLED JOISTS.
CAST & WROUGHT SCREW PILES.

IRON BRIDGES.
" JETTIES.
" ROOFS & BUILDINGS.



THE BRITANNIA IRON-WORKS, DERBY, have been established more than 50 years, and during the last 25 years have been continually extended and improved. During the years 1873-4 they have been doubled in extent. The Works being situated in the centre of the Iron and Coal Districts, and abutting upon the Railways and Canal, possess the greatest facilities for the Manufacture of Goods and their Delivery in all parts of the country, and to the ports for shipment.

ANDREW HANDYSIDE AND Co. (Limited) manufacture all kinds of Structures in Wrought and Cast Iron, and every year make for England and Foreign Countries many thousands of tons of Iron Girders, Landing Piers, Bridges, Roofs, and Buildings. Among the more important works constructed by ANDREW HANDYSIDE AND Co. have been the following :

AGRICULTURAL HALL, ISLINGTON.
ALBERT BRIDGE, OVER THE THAMES, LONDON.
ALEXANDRA PALACE, LONDON.
AMSTERDAM STATION, DUTCH-RHENISH RAILWAY.
BATH TERMINAL STATION, MIDLAND RAILWAY.
BROAD STREET TERMINAL STATION, NORTH LONDON RAILWAY.
CONSERVATORY, ROYAL HORTICULTURAL GARDENS, LONDON.

CZERNOWITZ BRIDGE, GALICIA.
HOOGLY FLOATING BRIDGE, CALCUTTA.
LIVERPOOL TERMINAL STATION, MIDLAND RAILWAY.
MARKETS IN THE CITY OF MADRID.
NERBUDDA BRIDGE, INDIA STATES RAILWAYS.
TRENT BRIDGE AT NOTTINGHAM.
WINTER GARDEN AT LEEDS INFIRMARY.

In addition to the above, during the last few years ANDREW HANDYSIDE AND Co. have constructed :

BRIDGES FOR AUSTRIA.
BRIDGES FOR AUSTRALIA.
BRIDGES FOR THE CAUCASUS.
BRIDGES FOR DENMARK.

BRIDGES FOR ENGLAND.
BRIDGES FOR INDIA.
BRIDGES FOR JAPAN.
BRIDGES FOR NORWAY.

BRIDGES FOR RUSSIA.
BRIDGES FOR SOUTH AMERICA.
BRIDGES FOR SWEDEN.
BRIDGES FOR TURKEY.

For more detailed particulars of Structural Ironwork see Catalogue A, forwarded free, or 'Works in Iron: Bridge and Roof Structures,' published by E. and F. N. Spon.

The Prices given on the following pages include delivery in London or to the ports for shipment.

ANDREW HANDYSIDE AND CO.,
LIMITED,

BRITANNIA IRON-WORKS, DERBY.

32, WALBROOK, LONDON.

Structural Ironwork—continued.

NOTE A.—The PRICE of Structural Ironwork is determined primarily by the current price of pig iron and rolled iron. The price of pig iron varies generally from £3 to £5. In the following prices £4 has been assumed as a basis. The price of rolled plates fluctuates from £10 to £16 per ton; bars and other forms of rolled iron having proportionate values. In the following prices £12 per ton for plates has been assumed as a basis.

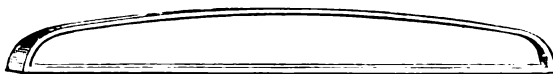
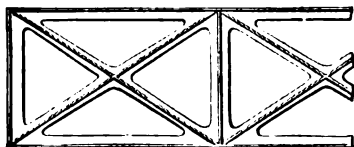


HANDYSIDE'S CAST-IRON COLUMNS.—From £8 to £12 per ton. The weight may be calculated from the thickness, which varies from $\frac{1}{2}$ inch to $\frac{3}{4}$ inch in columns of 6 inches diameter, from $\frac{3}{4}$ inch to $1\frac{1}{4}$ inch in columns of 12 inches diameter and upwards, according to the length and the load they have to carry. If of a simple kind, these prices include the cost of models. New models of elaborate character are expensive, but Andrew Handyside and Co. have a very large assortment of models in stock, as illustrated in their large Catalogue B. If Capitals of an



enriched character are required, they involve an additional cost, varying according to the amount of enrichment or elaboration. Thus the extra cost of ornamental Capitals for columns 5 inches diameter is from 3s. to 40s.; for columns 7 inches diameter, 5s. to 50s.; and for columns 10 inches diameter, from 10s. to 100s.

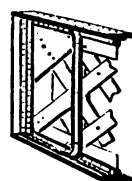
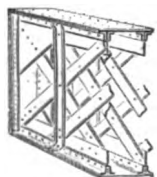
HANDYSIDE'S CAST-IRON STANCHIONS.—These are generally simpler and cheaper than columns, and cost from £8 to £10 per ton; the price per ton being generally the lowest for the heaviest patterns.



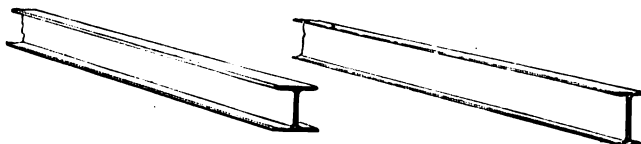
HANDYSIDE'S CAST-IRON GIRDERS.—Close Girders cost from £8 to £10 per ton. Open Trellis Girders, from £9 to £13 per ton.



HANDYSIDE'S WROUGHT-IRON GIRDERS.—There is an infinite variety of systems for Girders, and the advantages of each compare differently according to the site, the length of span, and for many other reasons. Plate Girders, Lattice, Trellis, and Warren Girders are the most usual kinds. Plate Girders cost from £17 to £21; Lattice Girders, from £19 to £23; Warren and other Girders similar in detail, £20 to £25 per ton; the exact price being determined mainly by the character of the design, the quality of the iron, and the repetition allowed. The latter point is of importance, because where numerous Girders are made alike, considerable economy may be obtained in the manufacture. The above prices are exclusive of the cost of fixing. See NOTE A, above.



HANDYSIDE'S ROLLED JOISTS.—Rolled Beams or Joists are sometimes used instead of Rivetted Girders of small depth. For small spans, or for carrying arched brick floors, or as small cross girders, or longitudinal



bearers in bridges, or as rafters in iron roofs these Rolled Beams are very useful. They are usually made from 4

inches to 14 inches deep, but beyond 10 inches a Rivetted Girder is in almost all cases preferable.

The Beams cost from £12 to £14 per ton, the smallest and narrowest sections being the cheapest. These prices are for the simple Beams as they leave the rolling mill; any labour necessary for attaching them to other ironwork involving extra cost. See NOTE A, above.

ANDREW HANDYSIDE AND CO.,
LIMITED,

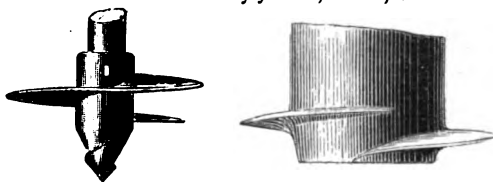
BRITANNIA IRON-WORKS, DERBY.

32, WALBROOK, LONDON.

Structural Ironwork—continued.

HANDYSIDE'S SCREW PILES.—These are used for supporting Bridges and other similar Structures, and allow Piers to be built in the water at moderate cost. Screw Piles may be made either of solid or hollow wrought iron, with cast-iron screws, or entirely of cast iron, the columns in the latter case being hollow. The form of screw depends on the strata which it has to enter, and the suitability of hollow or solid Piles depends also on other circumstances in each particular case. Hollow cast-iron Screw Piles are made of columns from 9 inches to 3 feet diameter, with Screw Blades from 1 foot to 5 feet diameter, and cost from £12 to £16 per ton. These prices include the cost of the necessary joints, bolts, &c. The form of Pile is determined by the height, the load to be carried, and the strata into which they are to penetrate.

Solid wrought-iron Piles are made from 4 inches to 9 inches diameter, and cost from £16 to £20 per ton; the expense of couplings, flanges, or other kinds of joints being incurred, as it is difficult to roll such thick pieces in any but moderate lengths. See NOTE A, p. 102.



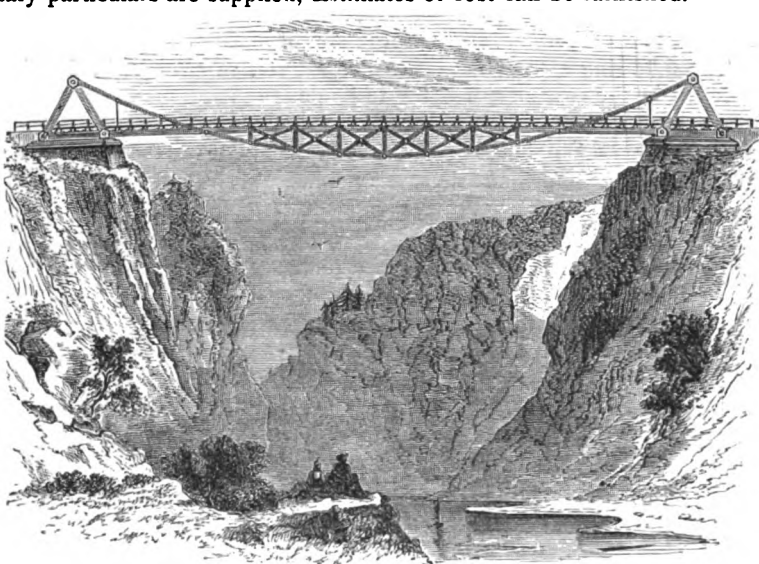
HANDYSIDE'S BRIDGES.—Where designs for Bridges and Estimates of cost are required, full information should be furnished on the following points: The Span, the width of the roadway, the material with which the roadway is to be covered, the nature of the traffic to be carried, the strata in the shores and river bed, the depth of water, the usual and flood levels, strength of current, headway required under Bridge, and other local particulars.

Cast iron is admirably adapted for Arched Bridges, and where the banks of a river allow abutments to be built at a moderate expense, such Bridges compare favourably in cost with other systems of construction. The Arched Bridge illustrated on page 101 is made of cast iron.

Wrought iron is, however, generally used for the superstructure of Bridges. The different kinds may be classed as Arched Bridges, Girder Bridges, and Suspension Bridges, and there are various systems of each. If the necessary particulars are supplied, Estimates of cost can be furnished.

ANDREW HANDYSIDE AND Co. have had a long and varied experience in the manufacture of Bridges for special situations in foreign countries, and can make designs to suit the exigencies of particular cases. Where carriage is difficult, the pieces can be arranged so as to be small and light. Where erection is difficult, as in the case of deep or rapid rivers, Bridges can be designed either for road or railway purposes which can be fixed without staging.

Handyside's Colonial Bridges are especially suitable for export, as they are light, economical, and easily fixed.



**ANDREW HANDYSIDE AND CO.,
LIMITED,**

BRITANNIA IRON-WORKS, DERBY.

32, WALBROOK, LONDON.

Structural Ironwork—continued.

HANDYSIDE'S LANDING PIERS AND JETTIES.—For making a Design and Estimate of Cost information must be furnished on the following points:



The length and width of the Jetty.

The height of the roadway from the bottom of the water. A section should be supplied, showing the slope of the ground from the shore and the depth of water at different times of tide or flood.

The nature of the sea (or river) bed. A decision as to the kind of Supports—Screw-piles, &c.—which are most

suitable, can only be arrived at when it is known whether they are to stand upon sand, rock, shingle, &c.

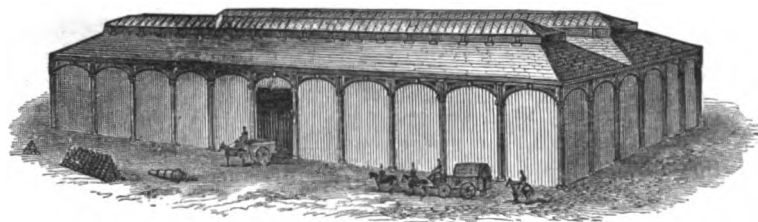
The purpose for which the Jetty is intended. If it be for the landing of goods, provision has generally to be made for the erection of cranes, and it is necessary to know where these are to be placed and the maximum weight they will lift. The weight of any carts, locomotives, or other vehicles which may come on the Jetty should be stated. If vessels are to lie alongside the Jetty their tonnage should be stated, and it must be known also whether the vessels will be so exposed to the wind or the waves as to make them roll against the Jetty.

It is useful to know if timber is procurable for the deck or platform of the Jetty, and for fender piles and booms.

HANDYSIDE'S IRON ROOFS.—Andrew Handyside and Co. have had great and special experience in the manufacture of Iron Buildings for all parts of the world, and amongst others made by them at Derby may be enumerated the Midland Railway Stations at Bath and at Liverpool, the North London Terminal Station at Broad Street, the Amsterdam Station of the Dutch-Rhenish Railway, the Agricultural Hall, London, the Conservatory of the Royal Horticultural Gardens, London, the Winter Garden at Leeds, and the large Markets in the city of Madrid.

The following extract from Chapter XVIII. of 'Works in Iron' describes the information which is needed in the case of a building to be designed and manufactured in England from particulars sent from a foreign country. On the completeness of this information depend very largely the cost of the structure, and its suitability for the purpose required. The information required is as follows:

1. The shape and dimensions of the plan and the height of the building.
2. The purpose for which the building is intended. Beyond a width of about 40 feet, the question arises whether the roof shall be made in one or more spans, and as the cost may in some cases be considerably diminished by having the roof supported at intervals between the walls, so reducing the width of any one span, it is necessary to know if intermediate columns or walls so placed will prove an obstruction.



SHELL FOUNDRY, WOOLWICH ARSENAL.

3. It should be stated whether the Iron Roof is to be supported on iron columns or on brickwork.

4. It must be known whether the building is to be open at the sides and ends, or to be enclosed, and if the latter, whether by walls or by iron screens or glass.

**ANDREW HANDYSIDE AND CO.,
LIMITED,**

BRITANNIA IRON-WORKS, DERBY.

32, WALBROOK, LONDON.

Structural Ironwork—continued.

5. As it is sometimes cheaper and better to make a roof hipped than gabled, any reason or preference for or against either plan should be given.

6. The nature of the climate should be stated with reference to the following points: The ventilating arrangements which may be needed; the kind of roof covering most suitable; the strength of the roof for resisting heavy winds or hurricanes; the nature and amount of light required; the gutters and rain pipes necessary.

7. The designer should be informed whether the structure is to have any ornamental character, or whether cheapness is the primary consideration.

The measurement, weight, and cost for roofs and buildings are generally stated according to the superficial area occupied, and the unit adopted is the "square" of 100 superficial feet. Thus an area 10 feet \times 10 feet, or an equivalent area, equals one square. The measurement for the covering of a roof is usually made on the slope of the roof, not on the horizontal area covered.

The following is a summary of the points which mainly determine the weight and cost of an Iron Roof or Building:

The weight of a roof depends primarily on *the span*, as the necessary strength increases rapidly with the distance between the supports. Thus in a trussed roof the framing for a span of 50 feet would be from 6 cwt. to 8 cwt. per square; for a span of 70 feet from 7 cwt. to 10 cwt. per square; while for a span of 100 feet the weight would be from 9 to 13 cwt. per square.

The regularity or irregularity of the space to be covered.

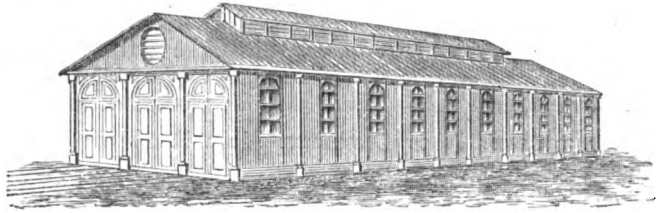
The kind of roof covering. Not only do the various kinds of covering differ in regard to cost, but the weights of the various materials differ considerably, and thus largely determine the strength necessary in the roof and the consequent weight and cost of the structure.

The amount of *repetition* allowed. A large building where the parts are similar is relatively cheaper than a small building of the same class. So also economy is obtained where several similar buildings are made at the same time with parts interchangeable.

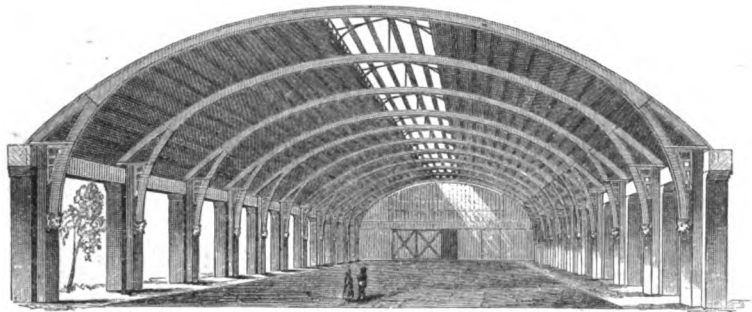
The nature of the design.

As a rule, arched roofs involve more expense than trussed roofs, because an arched roof requires abutments, while a trussed roof is complete and self-contained, only exerting a vertical pressure on the walls or columns which support it. Sometimes, however, it may be more economical to use an arched roof in cases where abutments

are provided without extra expense. Such, for instance, are cases where a building has very strong walls, or where there are side buildings which act as abutments, or where the arch springs from the ground, or, as in the case of a railway station in a cutting, where the retaining walls will be admirably suited to receive the thrust of an arched roof.



RAILWAY WAREHOUSE.



ANDREW HANDYSIDE AND CO.,
LIMITED,

BRITANNIA IRON-WORKS, DERBY.

32, WALBROOK, LONDON.

P

Structural Ironwork—continued.

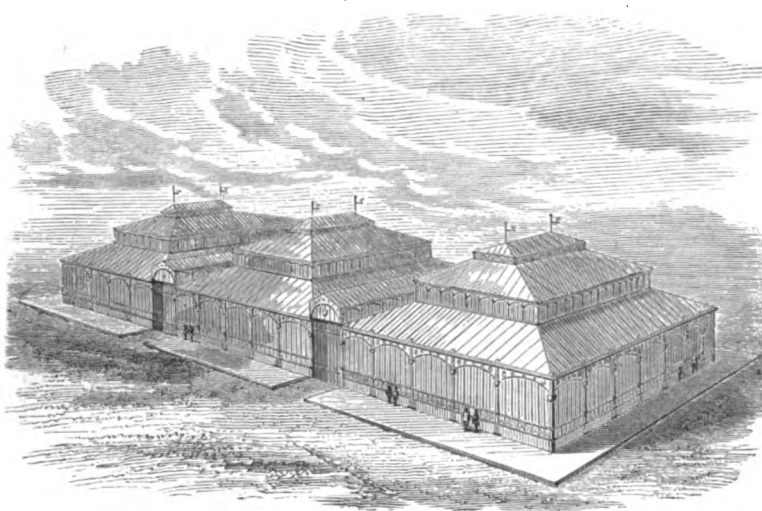
The cost per ton of iron roofing does not differ very much from that of girders, as stated on page 102, except that owing to the generally larger proportion of light pieces and smith's work, the lowest prices of girders do not apply. Thus while a range of from £17 to £25 per ton may be said to include all varieties of girders, from £19 to £26 may be said to include the different kinds of roofing. See NOTE A, page 102.

HANDYSIDE'S ROOF COVERING.—Iron Roofs may be covered with Galvanized Corrugated Iron, Zinc, Tiles, Slates, or Glass.

The iron framework of a roof having been provided, the additional cost of Galvanized Corrugated Iron (iron coated with zinc) is from £2 10s. to £5 per square of 100 superficial feet, the area being measured on the slope, and not on the dimensions of the ground covered. The above prices are based upon an assumed average value of £22 per ton for spelter (zinc), and upon the value of iron sheets when plates cost £12 per ton. The exact amount varies with the current price of spelter and the thickness of the sheets. The thickness is specified not in parts of an inch, but by the numbers of the Birmingham Wire Gauge (B. W. G.). Galvanized iron varies in thickness from 24 B. W. G. (.022 inch) to 16 B. W. G. (.065 inch). For good work in England, gauges 18 to 20 are generally used, 16 occasionally for places where great strength is required, and the thinner gauges—20 to 22—where economy is the chief consideration.

Zinc as used for roofs may be laid on the iron framing with or without boarding. The cost of zinc sheeting depends upon the current price of spelter and the shape and size of the roof. The thickness of the sheets is measured by a special zinc gauge, whose divisions approximate to those of the B. W. G. (see above), but with the numbers differently arranged. In zinc, the thickness increases with the numbers—No. 13 (.032 inch) to No. 16 (.049 inch) being generally used for roofing. Nos. 14 and 15 are those usual for good work. The cost of zinc covering ranges from £3 to £5 per square, measured on the slope of the roof.

CAST IRON IN BUILDINGS.—In the construction of Iron Buildings such as Railway Stations, Sheds, Warehouses, Markets, Conservatories, Cast Iron is generally employed for columns, gutters, spandrils, brackets, and for various small parts in the roof.



HANDYSIDE'S IRON MARKETS.—The use of iron for market buildings is becoming every year more general in England as well as in countries where other building materials are scarce. The engraving shows an Iron Market Building, erected by ANDREW HANDYSIDE AND Co., in Madrid, in 1874. Covered Sheds or Arcades cost from £18 to £25 per square (one square equals 100 superficial feet). Markets entirely enclosed cost from £25 to £45 per square, according to the span, height, ornament, &c. The above prices include the cost of

covering, but not the cost of excavation, foundations, masonry, or the erection of the market on the site. The erection costs approximately 10 per cent. on the purchase money.

ANDREW HANDYSIDE AND CO.,
LIMITED,

BRITANNIA IRON-WORKS, DERBY.

32, WALBROOK, LONDON.

MALLEABLE IRON CASTINGS.

ANDREW HANDYSIDE AND CO. (Limited) have lately erected a large new Foundry and Annealing Furnaces for the production of Malleable Iron Castings in any quantity. Malleable Castings may be substituted with advantage in many cases for Wrought Iron and Cast Steel. Prices on application.

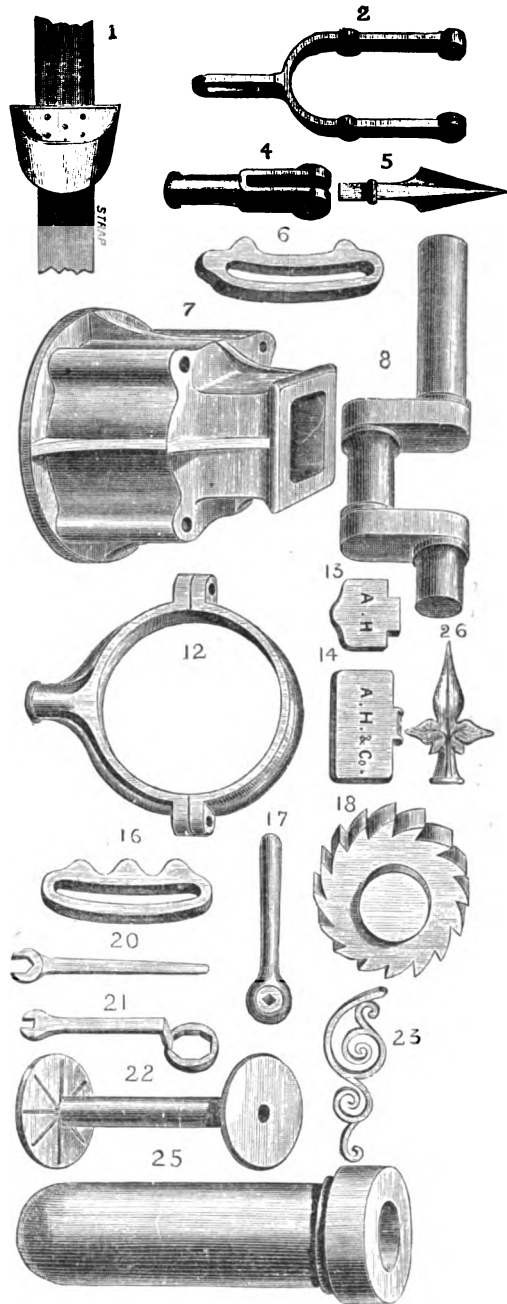
These Castings may be bent, hammered, and twisted without fracture, and can without risk be exposed to concussion, torsion, or other sudden strains, which could not be endured by ordinary Cast Iron. The fact that they can be run, when fluid, into small and intricate moulds, renders these annealed Castings valuable for many situations where forged Wrought Iron would either be very expensive or altogether impossible to deal with. In a Steam Engine or other Machine there are many small parts which are subject to such sudden shocks and torsion that Cast Iron must be of extreme thickness to endure them, while, at the same time, these parts do not require all the ductility and elasticity of Wrought Iron. It is in these cases that Malleable Castings are valuable.

The Engraving illustrates some of the uses to which, as referred to above, Malleable Cast Iron may be applied. Cross-heads, Links, Eccentric Straps, small Cranks, Locomotive Axle-Boxes, Buffer Cylinders, Axle-Box Lids, Pinions, Worm Wheels, Spanners—are all cases where something tougher than ordinary Cast Iron is needed, and where the expense of Wrought Iron may be avoided.

Malleable Cast Iron may also often be substituted with advantage for copper and brass, both as regards its strength and its good wearing properties, which render it especially suitable for clutches, eccentric straps, &c. It is impossible to enumerate all their uses, but there is hardly any kind of Machine in which Malleable Castings may not be used with advantage.

The attention of Engineers has been much directed to the use of *Cast Steel* for machinery and structural purposes; but it is found difficult to get sound, strong Castings, except in simple shapes that can afterwards be rolled or hammered. In many such cases Malleable Cast Iron will, to a very considerable extent, supply the place of Steel, as, owing to the chemical changes that take place during manufacture, the Malleable Cast Iron becomes almost as soft Steel.

Prices vary from 3½d. to 5d. per lb. according to the size, shape, and quantity ordered.



ANDREW HANDYSIDE AND CO.,
LIMITED,

BRITANNIA IRON-WORKS, DERBY.

32, WALBROOK, LONDON.

P 2

ORNAMENTAL IRONWORK.

As an addition to their old-established Foundry for Heavy and General Castings, ANDREW HANDYSIDE AND Co. (Limited) have recently built one of the largest Foundries in England for Light and Ornamental Castings. From their very large stock, A. H. and Co. have selected about 1500 of the most useful designs, and have catalogued them. The designs are carefully drawn to scale, and are neatly lithographed. The dimensions of each design are placed against it, and each is numbered for reference.

The Catalogues are divided into Sections as follows :

Catalogue B.

I.—RAILINGS AND GATES.

II.—LAMP PILLARS AND LAMP BRACKETS.

III.—BALUSTERS, CRESTINGS, AND TERMINALS.

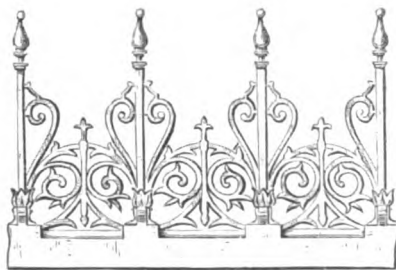
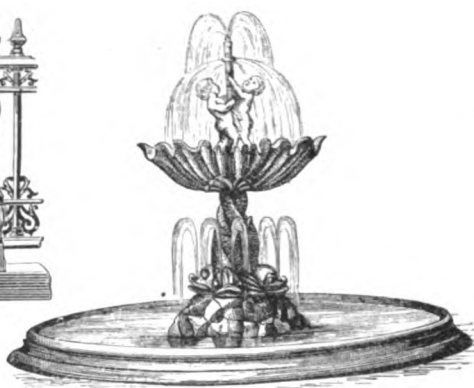
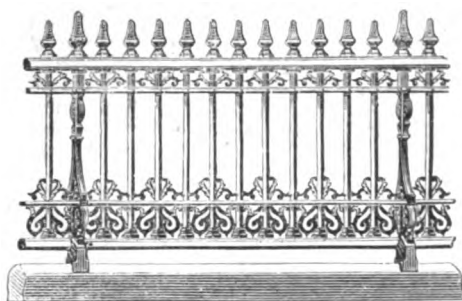
IV.—PANELS, ROSETTES, AND GRATINGS.

V.—BRACKETS, COLUMNS, AND COLUMN CAPITALS.

VI.—WINDOWS AND CASEMENTS.

VII.—CONSERVATORIES AND BAND STANDS.

Catalogue C.—VASES, FOUNTAINS, AND DRINKING FOUNTAINS.



ANDREW HANDYSIDE AND CO.,

LIMITED,

BRITANNIA IRON-WORKS, DERBY.

32, WALBROOK, LONDON.

SMITHS' HEARTHES.

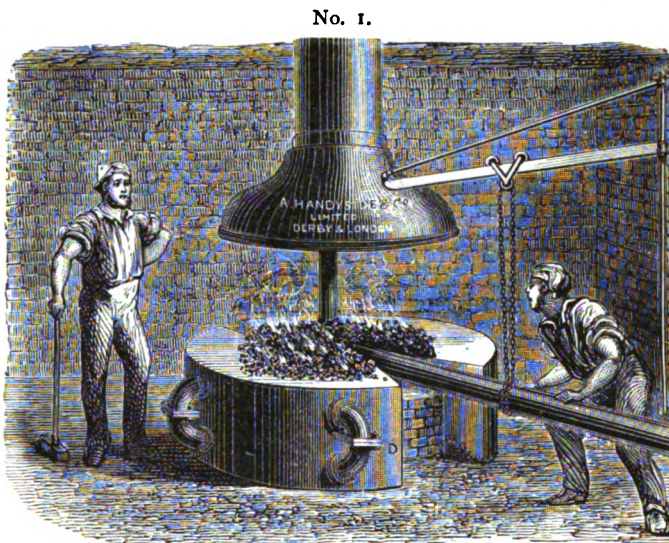
ANDREW HANDYSIDE AND Co. have for many years made a speciality of the manufacture of SMITHS' HEARTHES, and make them of all sorts and sizes for every kind of Smiths' work.

The Smithies of the Royal Small Arms Factory at Enfield are fitted with Handyside's Hearths, and they are also used at the Royal Arsenal, Woolwich, and by many of the principal Engineers in England and abroad.

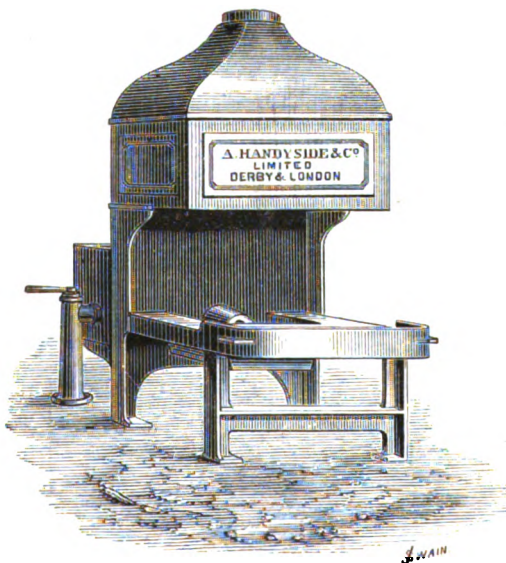
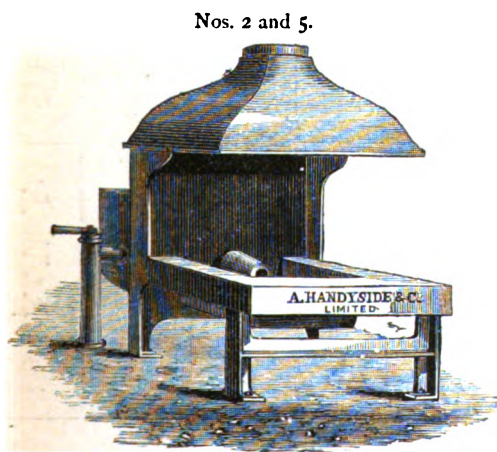
Purchasers are supplied with full particulars about the Blast, the Fan, the Blower, the Tuyere, Blast Pipes, Smoke Pipes, and other useful information concerning the arrangement of a Smithy.

No. 1.—An Annular Hearth, cast in one piece. It is divided into an upper and lower chamber. The branch pipe is connected to the main blast-pipe under ground, and the blast passing into a chamber is taken by three tuyeres into the fire. The upper chamber is kept full of water for the constant supply of the tuyeres, and the water also keeps cool the inner surface of the Hearth, and protects it from the action of the fire.

Nos. 2 and 5.—These Hearths are adapted for the larger forgings in an Engineer's factory. The plate is 4 feet by 3 feet 9 inches, and all are large in proportion. The back plate can be lined with fire bricks. Besides the water cistern for the tuyere, there is in No. 2 Hearth a double cistern in front, one compartment 10 inches wide, for a slack trough, and the other 13 inches wide, for fuel. A screen to the hood and movable bracket to the fire plate are included.



Nos. 3, 4, and 6.



ANDREW HANDYSIDE AND CO.,
LIMITED,

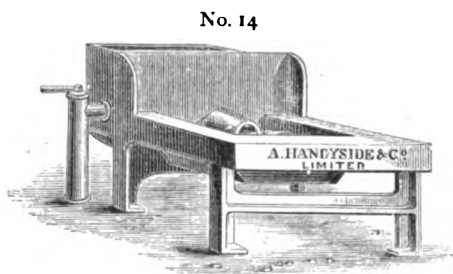
BRITANNIA IRON-WORKS, DERBY.

32, WALBROOK, LONDON.

SMITHS' HEARTHES.

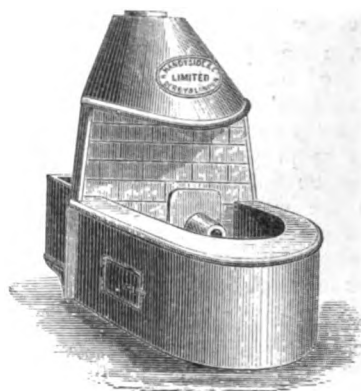
Nos. 3, 4, and 6.—In these Hearths the hood or bonnet is raised and the space so gained is enclosed by a square case which should be lined with fire brick. This arrangement reduces the radiation of heat, and by improving the draught prevents smoke in the Smithy. A screen to the hood and movable bracket to the fire plate are included.

No. 14.—This Hearth is designed for ship-builders, bridge-builders, and others, who have rough work in the open yard, where a strong, cheap Hearth is required. The plate measures 3 feet 6 inches by 3 feet 6 inches, and the Hearth somewhat resembles No. 5, without the hood. Weight, about 10 cwt.



No. 15.—This Hearth is specially designed for chain makers, whose heavy work would break an ordinary iron hearth, and renders frequent repairs necessary in a brick hearth.

No. 15.



No.	Size of Hearth Plate.	Price without Fire Bricks.		Fire Bricks extra.	Stand Pipe extra.	Approximate weight of Hearth.	Approximate weight of Fire Bricks.	Diam. of Smoke Pipe required.
		Fitted with Water Tuyere.	Fitted with Patent Tuyeres.					
		£ s. d.	£ s. d.			cwt.	cwt.	
1	5' 0" diam.	37 0 0	..	..	..	30	..	..
2	3' 9" x 4' 0"	22 0 0	20 5 0	19/	36/	21	5	12"
3	3' 9" " 4' 0"	22 0 0	20 5 0	28/	36/	22	7	12"
4	4' 0" " 3' 6"	20 10 0	19 5 0	32/	36/	19	6	10"
5	4' 0" " 3' 6"	17 5 0	16 0 0	15/	36/	16	5	10"
6	3' 6" " 2' 8"	15 0 0	13 15 0	23/	36/	13	4	9"
7	3' 6" " 2' 7"	17 0 0	16 0 0	27/	36/	17	7½	9"
8	2' 6" diam.	13 5 0	13 10 0	26/	36/	14	6	9"
9	1' 9" "	6 0 0	6 5 0	..	..	5	..	7"
14	..	9 17 6	..	..	36/	10	..	..
15	..	26 10 0	..	30/	36/	18	6	..

ANDREW HANDYSIDE AND CO.,

LIMITED,

BRITANNIA IRON-WORKS, DERBY.

32, WALBROOK, LONDON.

PORTABLE FORGES.

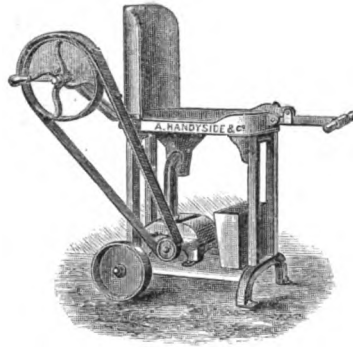
These Forges differ from those hitherto used in England, and present several new features. The essential part of any Smith's hearth or forge is the *Blast*, and the usual plan of producing the blast by bellows is open to many objections. The bellows is liable to be burnt, cut, or otherwise damaged; and once in such a condition the forge is useless. Although the bellows is often enclosed in a box, the above objections remain.

Hitherto, in the effort to reduce the Portable Forge to such limits as to make it portable, the bellows has been so diminished, and the blast and heating capacity so reduced, as to be of little value for practical purposes. The only alternative to the bellows has till lately been the *Fan*, which is entirely inapplicable to a Portable or Self-contained Forge, because of the very high speed and the consequent power which is required to produce the blast.

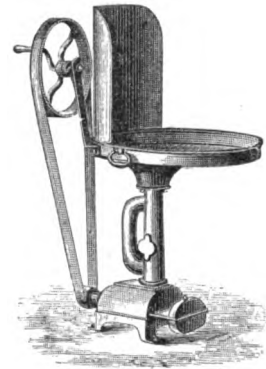
No. 11.



No. 12.



No. 13.



These Portable Forges are believed to be superior to any others in use. They occupy but little room, are convenient in all their arrangements, are operated with little power, and possess *great heating capacity*. For the ease and readiness with which a strong blast is obtained, the bellows is not to be compared to the Blower. Although slightly heavier than the sheet-iron forges with bellows, these Forges are much stronger, and form useful and permanent Hearths. The parts are few in number, and are all made of cast iron, as light as is consistent with strength.

The Forges are complete in themselves, do not require to be fastened to the ground, and can be set to work directly.

No.	Size of Hearth Plate.	Price.			Travelling Wheels extra.	Approximate weight.
		£	s.	d.		cwt.
10	3' 4" × 2' 2"	17	10	0	15/	5½
11	2' 6" „ 1' 9"	12	10	0	15/	3½
12	1' 8" „ 1' 2"	9	2	6	..	2½
13	1' 9" „ 1' 3"	8	0	0	..	1½

No. 12 is always mounted on wheels, which are included in the price. No. 13 does not require wheels.

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